Energy Efficient Cool Roofs

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SMUD Residential Cool Roofing for Contractors

Sacramento, CA

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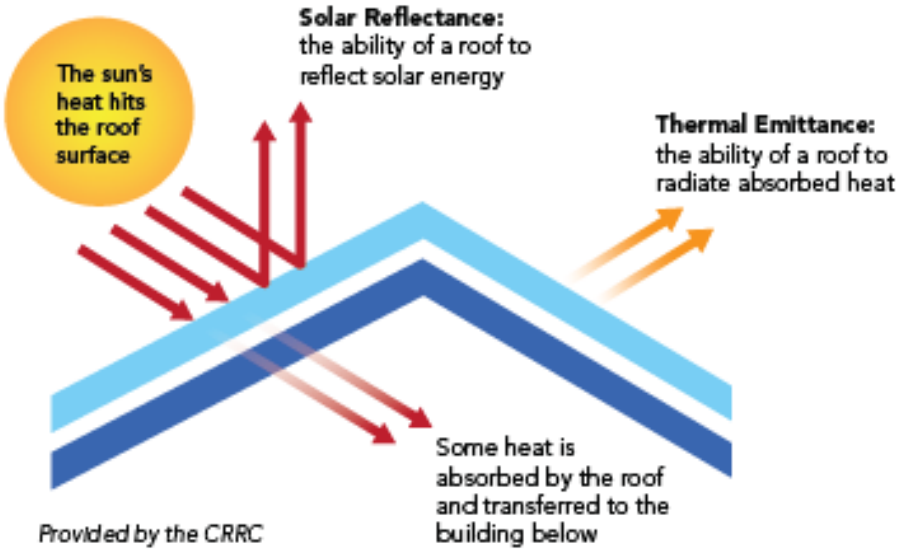
Topics

- **Energy efficient** roofing products
- **2016 Energy Standards** for residential roofs
- **Alterations, additions** and **new construction**

Energy Efficient Roofs

Cool Roof is a concept for saving energy

- A cool roof will reflect more sunlight and absorb less heat than a standard roof



- The roofing product must meet minimum Solar Reflectance and Thermal Emittance values to be considered a cool roof

Cool Roof Definitions

Solar Reflectance (SR): ability to reflect solar energy from the sun back into the atmosphere

Thermal Emittance (TE): the ability to release heat that has been absorbed

Solar Reflectance Index (SRI): combines SR three year *aged* value and TE in an equation

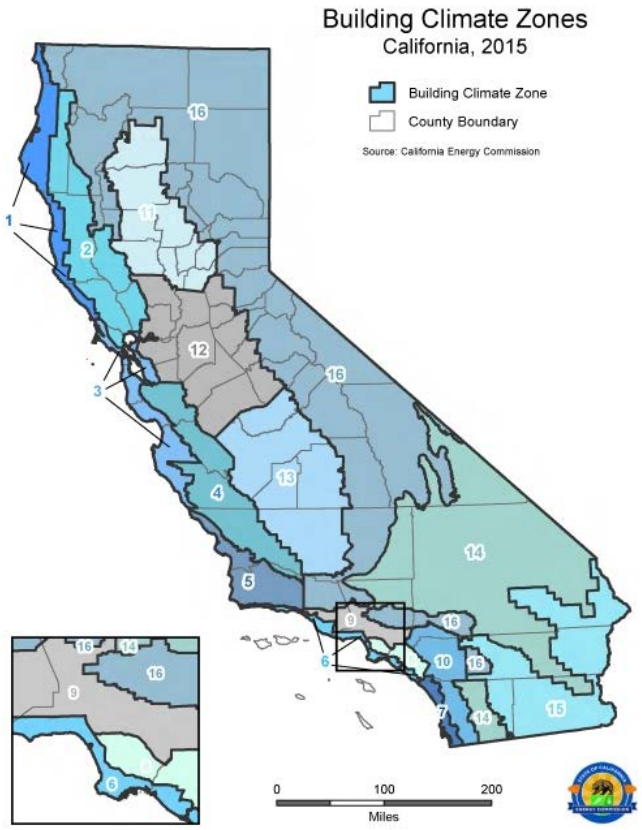
The higher the number, the cooler the roof

Cool Roof Benefits

- Energy cost savings
- Reduces attic temperature
- Reduces use of air conditioner
- Conditioned space stays cooler
- Improves occupant comfort
- Available in many colors
- Lots of styles and material choices
- Lasts longer than standard roof

Photo Credit: Eagle Roofing

Cool Roof FAQs



- Is it required in my climate zone?
- Do I need a radiant barrier?
- Does it have to be white?
- What is considered a reroof?
- Do I need permits and forms?

2016 Energy Standards

Mandatory Measures

- § 10-113: Cool Roof Rating Council (CRRC) is responsible for certifying cool roof products

  www.coolroofs.org

- § 110.8(i): How to determine cool roof efficiency with *aged* Solar Reflectance, Thermal Emittance and SRI calculations

Residential Roof Alterations

What is a roofing alteration?

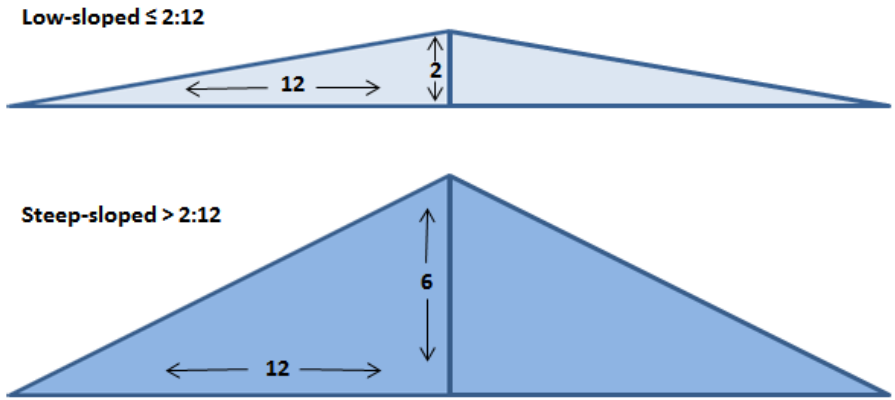
- Re-roof or roof replacement

When is code trigged for *cool roofs*?

- More than 50% of existing roof area is replaced

Does the roof slope make a difference?

- Low-sloped ≤ 2:12
- Steep-sloped > 2:12



Residential Re-Roof Steep-sloped § 150.2(b)1Hi

- Prescriptive requirements in Climate Zones 10–15
  - Minimum 0.20 aged SR and 0.75 TE, or minimum 16 SRI
- Exceptions
  - 1” of air space between roof deck and roofing product
  - Profile ratio 1:5 rise to width for more than half the width
  - Existing ducts are sealed and insulated per § 150.1(c)9
  - R-38 ceiling insulation
  - Radiant barrier in attic per § 150.1(c)2
  - No ducts in attic
  - R-2 or greater insulation above roof deck

Residential Re-Roof Low-sloped § 150.2(b)1Hii

- Prescriptive requirements in Climate Zones 13 and 15
  - Minimum 0.63 aged SR and 0.75 TE, or minimum 75 SRI
- Exceptions
  - No ducts in attic
  - Lower aged solar reflectance can be installed when roof deck insulation is installed per TABLE 150.2-B

TABLE 150.2-B AGED SOLAR REFLECTANCE INSULATION TRADE OFF TABLE

Aged Solar Reflectance	Roof Deck Insulation R-value	Aged Solar Reflectance	Roof Deck Insulation R-value
0.62-0.60	2	0.44-0.40	12
0.59-0.55	4	0.39-0.35	16
0.54-0.50	6	0.34-0.30	20
0.49-0.45	8	0.29-0.25	24

Residential Additions § 150.2(a)

- Prescriptive requirements
  - **Steep-sloped** roofs meet minimum 0.20 aged SR and 0.75 TE, or 16 SRI in Climate Zones 10–15
  - **Low-sloped** roofs meet minimum 0.63 SR and 0.75 TE, or 75 SRI in Climate Zones 13 and 15
- Exceptions
  - Additions 300 square feet or less

CRRC COOL ROOF RATING COUNCIL ®

	Initial	Weathered
Solar Reflectance	0.00	Pending
Thermal Emittance	0.00	Pending
Rated Product ID Number		_ _ _ _
Licensed Seller ID Number		_ _ _ _
Classification		Production Line

Cool Roof Rating Council ratings are determined for a fixed set of conditions, and may not be appropriate for determining seasonal energy performance. The actual effect of solar reflectance and thermal emittance on building performance may vary.

Manufacturer of product stipulates that these ratings were determined in accordance with the applicable Cool Roof Rating Council procedures.

Residential New Construction § 150.1(c)11

- Prescriptive requirements
  - **Steep-sloped** roofs meet minimum 0.20 aged SR and 0.75 TE, or 16 SRI in Climate Zones 10–15
  - **Low-sloped** roofs meet minimum 0.63 SR and 0.75 TE, or 75 SRI in Climate Zones 13 and 15
- Exceptions
  - Building integrated photovoltaic panels and building integrated solar thermal panels
  - Roof constructions that have thermal mass over the roof membrane with a weight of at least 25 lbs./ft^2

Online Resource Center (ORC)

Online Resource Center

The Online Resource Center is provided to assist the building community and enforcement agencies with Building Energy Efficiency Standards (Energy Standards) compliance. Energy Standards apply to newly constructed buildings, as well as additions and alterations for existing buildings. Presently, the Energy Standards are updated every three years.

To assist in the compliance process, we provide compliance documents and free Public Domain Compliance Software programs for commercial and residential buildings. Training and links to the Energy Standards and compliance software are available on the Energy Commission website and at utility training centers throughout the state. To help direct you to an appropriate resource, Energy Commission and external resource information are provided on this page.

Building Energy Efficiency Standards

2016 Energy Standards

2013 Energy Standards

Past Energy Standards

Energy Standards Information and Training Materials

Overview

Commissioning

Covered Processes

Follow

Energy Standards Questions?

- Energy Standards Hotline

Energy Standards Booth Handouts

- Handouts - 02212017 (zip file, 507 mb)
- Help with the zip file

Forms

- 2016 Residential Compliance Forms
- 2016 Nonresidential Compliance Forms

Trainings & Events

- Energy Standards Outreach & Education Schedule
- Utility Sponsored Training Schedules

Subscribe

Building Standards List Serve

Automated Email Notifications

First name:

Last name:

Email address:

http://www.energy.ca.gov/title24/orc/

Blueprint

- Email Newsletter
- Published quarterly
- Clarifications on frequently asked questions
- http://www.energy.ca.gov/efficiency/blueprint/

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BLUEPRINT

California Energy Commission
Efficiency Division

In This Issue

New Mechanical Acceptance Test Technician Certification Provider

On January 13, 2016, the California Energy Commission (Energy Commission) approved the National Environmental Balancing Bureau (NEBB), as a mechanical Acceptance Test Technician Certification Provider (ATTCP).

This gives NEBB the authority to train, certify, and oversee acceptance test technicians (ATTs) and their employers. NEBB will train and certify ATTs to perform all 17 mechanical acceptance tests required in the *2013 Building Energy Efficiency Standards* (Energy Standards).

The Conditions of Approval are available for review in the **Executive Director's recommendation**.

For more information, please visit: **http://energy.ca.gov/title24/attcp/**.

Small Duct High Velocity Space Conditioning Systems

Small duct high velocity (SDHV) systems may be used to comply with the Energy Standards. The following is a list of requirements with direction on how SDHV systems can comply with the low-rise residential requirements of the Energy Standards.

Mandatory Requirements

United States Department of Energy Standards:

SDHV systems manufactured on or after January 23, 2006, and before January 1, 2015, must have a minimum Seasonal Energy Efficiency Ratio (SEER) of 11, and a minimum Heating Seasonal Performance Factor (HSPF) of 6.8.

SDHV systems manufactured on or after January 1, 2015, must have a minimum SEER of 12, and a minimum HSPF of 7.2.

Energy Standards:

Section 150.0(m)13B - Single zone systems that use forced air ducts to supply cooled air to an occupiable space must either meet minimum airflow and fan efficacy requirements, or meet the return duct and grille sizing requirements of **TABLES 150.0-C or 150.0-D**.

NOTE: The return duct and grille sizing alternative will likely be the method chosen for compliance when installing a SDHV system.

Section 150.0(m)15 - Specific to systems with multiple thermostatically controlled zones, this section requires the same mandatory airflow and fan efficacy requirements as **Section 150.0(m)13B**. However, it does not have the same duct and grille sizing alternative. If such systems cannot satisfy the airflow and fan efficacy requirements of this section, compliance must be demonstrated via the performance approach.

The duct leakage and insulation requirements apply as with any other system.

Prescriptive Requirements

The refrigerant charge and duct insulation requirements apply as with any other system.

Energy Standards Hotline

- Open Monday through Friday

  8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 4:30 p.m.

- Call

  800-772-3300 (in CA)

  916-654-5106 (outside CA)

- Email

  Title24@energy.ca.gov

Questions